

EXERCISES

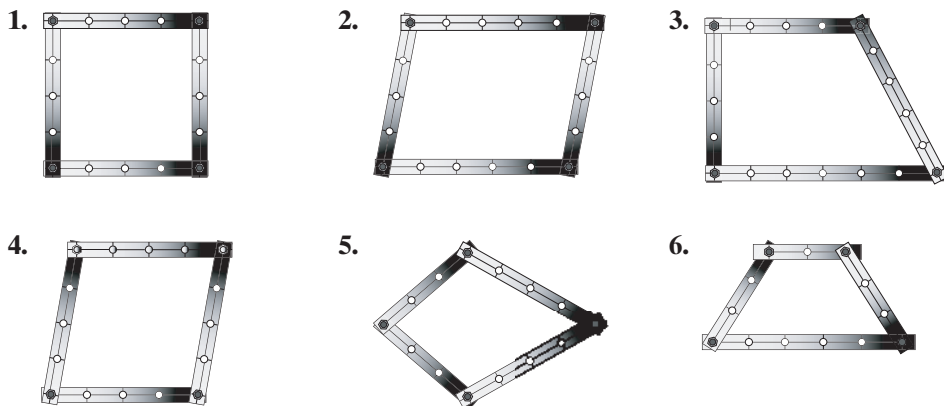
For more practice, see *Extra Practice*.

Practice and Problem Solving

A Practice by Example

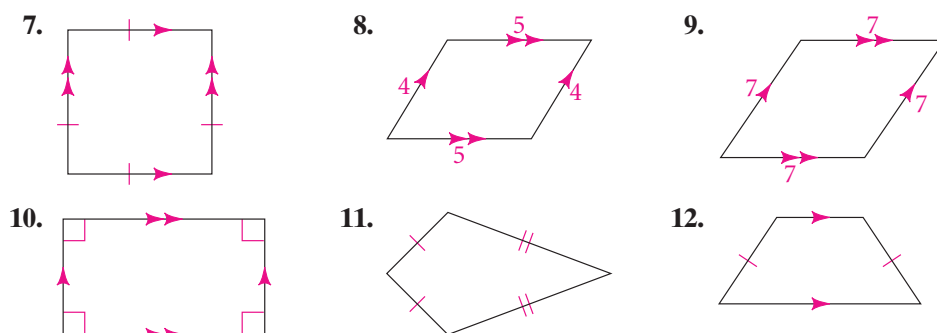
Example 1
(page 289)

These quadrilaterals are made from a toy building set. Judging by appearance, classify each quadrilateral in as many ways as possible.



Example 2
(page 289)

Determine the most precise name for each quadrilateral.

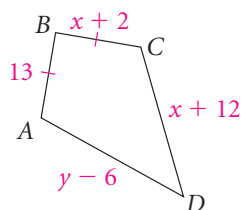


Coordinate Geometry Graph and label each quadrilateral with the given vertices. Then determine the most precise name for each quadrilateral.

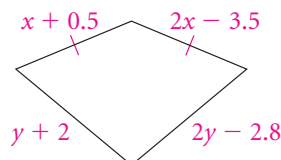
13. $A(3, 5), B(7, 6), C(6, 2), D(2, 1)$
14. $W(-1, 1), X(0, 2), Y(1, 1), Z(0, -2)$
15. $J(2, 1), K(5, 4), L(7, 2), M(2, -3)$
16. $R(-2, -3), S(4, 0), T(3, 2), V(-3, -1)$
17. $N(-6, -4), P(-3, 1), Q(0, 2), R(-3, 5)$
18. $E(-3, 1), F(-7, -3), G(6, -3), H(2, 1)$

Example 3 x^2 **Algebra** Find the values of the variables. Then find the lengths of the sides.

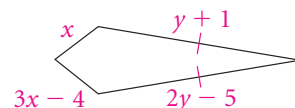
19. kite



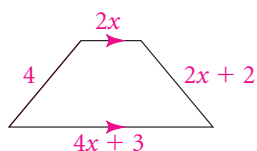
20. kite



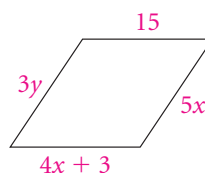
21. kite



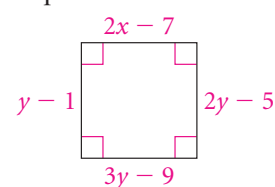
22. isosceles trapezoid



23. rhombus

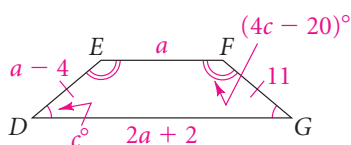


24. square

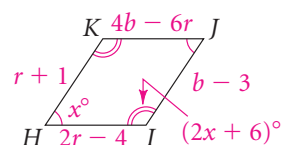


B Apply Your Skills **Algebra** In each figure, find the measures of the angles and the lengths of the sides.

25. isosceles trapezoid $DEFG$



26. rhombus $HKJI$



Exercise 27

27. Art American artist Charles Demuth created *My Egypt*, the oil painting pictured at the left. It is in an art style called Cubism, in which subjects are made of cubes and other geometric forms. Identify the types of special quadrilaterals you see in the painting.

28. Identify a parallelogram, rhombus, rectangle, square, kite, and trapezoid in your classroom. State whether your trapezoid is isosceles.

Draw each figure on graph paper. If not possible, explain.

29. a parallelogram that is neither a rectangle nor a rhombus

30. an isosceles trapezoid with vertical and horizontal congruent sides

31. a trapezoid with only one right angle

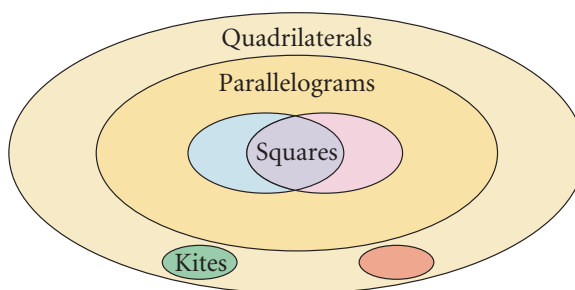
32. a trapezoid with two right angles

33. a rhombus that is not a square

34. a kite with two right angles

35. Writing Describe the difference between a rhombus and a kite.

36. Copy the Venn diagram. Add the labels *Rectangles*, *Rhombuses*, and *Trapezoids* to the diagram in the appropriate places.



State whether each statement is true or false. Justify your response. You may find the diagram from Exercise 36 helpful.

37. All squares are rectangles.

38. A trapezoid is a parallelogram.

39. A rhombus can be a kite.

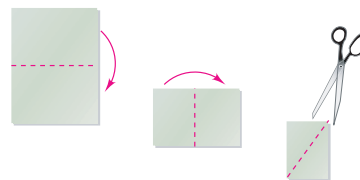
40. Some parallelograms are squares.

41. Every quadrilateral is a parallelogram.

42. All rhombuses are squares.



- 43. Paper Folding** Fold a nonsquare, rectangular piece of paper in half horizontally and then vertically, as shown at the right. Draw and then cut along the line connecting the two opposite corners containing a fold. What quadrilateral do you find when you unfold the paper? Why doesn't it matter what size rectangle you start with?



Identify a parallelogram, rhombus, rectangle, square, kite and trapezoid at each site. State whether your trapezoid is isosceles.

44. home 45. somewhere other than school and home

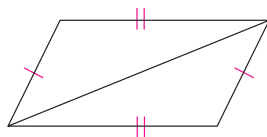
Name each type of special quadrilateral that can meet the given condition. Make sketches to support your answers.

46. exactly one pair of congruent sides 47. two pairs of parallel sides
48. four right angles 49. adjacent sides that are congruent

- 50. Error Analysis** Lauren argues, "A parallelogram has two pairs of parallel sides, so it certainly has one pair of parallel sides. Therefore a parallelogram must also be a trapezoid." What is the error in Lauren's argument?

Name the type of special quadrilateral it appears that you can form by joining the triangles in each pair. Make sketches to support your answers.

Sample two congruent scalene triangles



parallelogram

51. two congruent scalene right triangles 52. two congruent equilateral triangles
53. two congruent isosceles right triangles 54. two congruent isosceles acute triangles
55. a. **Open-Ended** Graph and label points $K(-3, 0)$, $L(0, 2)$, and $M(3, 0)$.
Find possible coordinates for point N so that $KLMN$ is a kite.
b. Explain why there is more than one possible fourth vertex.



Need Help?

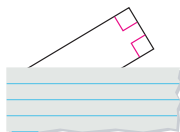
In Exercises 51–54, if you join one of the two triangles, you may find different quadrilaterals.



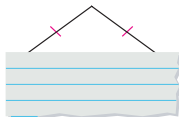
Challenge

Reasoning A scrap of paper covers part of each quadrilateral. Name all the special quadrilaterals that each could be. Explain each choice.

56.



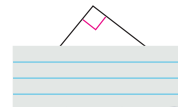
57.



58.



59.





Standardized Test Prep

Multiple Choice

60. Which statement is NEVER true?
 A. Square $ABCD$ is a rhombus.
 B. Parallelogram $PQRS$ is a square.
 C. Trapezoid $GHJK$ is a parallelogram.
 D. Square $WXYZ$ is a parallelogram.
61. Which statement is true for some, but not all, rectangles?
 F. Opposite sides are parallel.
 G. It is a parallelogram.
 H. Adjacent sides are perpendicular.
 I. All sides are congruent.
62. A parallelogram has four congruent sides. Which name best describes the figure?
 A. trapezoid B. parallelogram C. rhombus D. square
63. Which name best describes a parallelogram with four congruent angles?
 F. kite G. rhombus H. rectangle I. square
64. $A(-3, 1)$, $B(-1, -2)$, and $C(2, 1)$ are three points of quadrilateral $ABCD$. Could $ABCD$ be a rectangle? Explain.



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Short Response

Mixed Review

Lesson 5-5

Can a triangle have sides with the given lengths? Explain.

65. 8 mm, 6 mm, 3 mm 66. 5 ft, 20 ft, 7 ft 67. 3 m, 5 m, 8 m

Lesson 4-1

Quadrilaterals $RSTV$ and $NMQP$ are congruent. Find the length of the side or the measure of the angle.

68. \overline{MN}

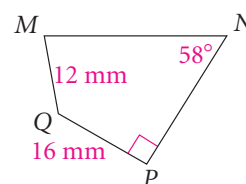
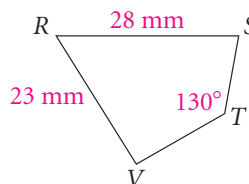
69. \overline{VT}

70. \overline{ST}

71. $\angle S$

72. $\angle V$

73. $\angle R$



Lesson 3-6

74. Write an equation for the line parallel to $y = -3x - 5$ that contains point $(0, 4)$.